What is claimed is:

1.   An image processing apparatus comprising:

first image processing means for performing a first image process;

second image processing means for performing a second image process; and

control means for selecting said first image process and said second image process based on a number of colors of a color image to be processed.

2.   An image processing apparatus comprising:

color number determination means for determining a number of colors of a color image;

first labeling means for labeling in a first labeling method;

second labeling means for labeling in a second labeling method; and

control means for instructing said first or second labeling means to perform a labeling process based on the number of colors of the color image.

3.   The apparatus according to claim 2, wherein:

said first labeling means performs a labeling process by clustering color palettes for a color image

other than a full-color image; and

said second labeling means performs a labeling process on the full-color image by an adjacency expanding method.

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4. An image processing apparatus comprising:

read information obtaining means for obtaining read information about an input image;

unicolor range setting means for setting a
10 unicolor range of the input image according to the read information about the input image; and

labeling means for labeling the input image by assigning a same label to a connection picture element in the unicolor range set by said unicolor range
15 setting means.

5. The apparatus according to claim 4, wherein said read information about the input image comprises at least one of a number of colors of the
20 input image, read resolution, luminance value, color saturation, color difference between adjacent picture elements, and color variance.

6. The apparatus according to claim 4, wherein
25 said labeling means changes a labeling method

according to the read information about the input
image.

7.   The apparatus according to claim 6, wherein
        said labeling means performs a labeling process
by an area expanding method, or by clustering color
distribution of an image.

8.   The apparatus according to claim 4, wherein
        said labeling means comprises clustering means
for classifying similar colors of a color image into
a same cluster, and assigns same labels to picture
elements connected by a color belonging to the same
cluster.

9.   The apparatus according to claim 4, wherein:
        said read information obtaining means comprises:
                local area extraction means for extracting
a local area from the input image; and
                color difference information extraction
means for extracting color difference information
about the input image from the local area, and
        said unicolor range setting means comprises
                threshold setting means for setting a
labeling threshold for the input image according to

the color difference information.

10.   The apparatus according to claim 9, wherein:
said local area extraction means comprises

5   mesh area extraction means for extracting a mesh area whose color variance is within a predetermined range among mesh areas obtained by dividing the input image;

said color difference information extraction
10   means comprises

standard deviation computation means for computing a standard deviation of a color in the extracted mesh area; and

said threshold setting means sets a labeling
15   threshold based on a mean value of the standard deviations obtained for each mesh area.

11.   The apparatus according to claim 9, wherein:
said labeling means comprises:

20   average color computation means for computing an average color of connection areas assigned same labels; and

color difference computation means for computing a color difference between the average color
25   of the connection area and a color of a picture

element adjacent to the connection area, and

when the color difference is equal to or smaller than the threshold, a same label assigned to the connection area is assigned to the picture element.

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12. The apparatus according to claim 4, wherein said unicolor range setting means comprises

color conversion means for converting a color of a color signal such that a resolution of a color difference by naked eyes to a first color matches a resolution of a color difference by naked eyes to a second color.

13. The apparatus according to claim 12, wherein said color conversion means reduces a color difference of a color around a color with low color saturation, and enlarges a color difference of a color around a color with high color difference.

14. The apparatus according to claim 4, wherein:

said read information obtaining means comprises resolution computation means for computing read resolution of a color image for each color element;

said unicolor range setting means sets a labeling threshold based on the read resolution of each color

element.

15. The apparatus according to claim 4, further comprising grouping means for grouping label patterns generated by said labeling means.

16. The apparatus according to claim 15, wherein said grouping means comprises pattern setting means for setting a pattern of a specific shape, and removes the pattern of the specific shape from patterns to be grouped.

17. The apparatus according to claim 16, wherein said specific shape is an L shape or a ⊐ shape.

18. The apparatus according to claim 15, wherein said grouping means comprises search range setting means for setting a search range of patterns to be grouped.

19. The apparatus according to claim 15 wherein said grouping means groups patterns in a unicolor range set by said unicolor range setting means into a same group.

20.   The apparatus according to claim 19, wherein
a color of said patterns has an average value of
colors of picture elements assigned same labels.

5   21.   The apparatus according to claim 15, wherein
said grouping means comprises enclosing rectangle
generation means for generating an enclosing rectangle
of patterns assigned same labels, and groups the
patterns based on a size, shape, or position of the
10   enclosing rectangle.

22.   The apparatus according to claim 15, wherein
said grouping means comprises thickness
computation means for computing a thickness of the
15   patterns assigned the same labels, and groups patterns
based on the thickness of the patterns.

23.   The apparatus according to claim 22, wherein:
said thickness computation means comprises:
20   scanning means for scanning an image in a
predetermined direction; and
outline length computation means for
computing a length of an outline of a pattern in the
image.

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24. The apparatus according to claim 15, further comprising:

group information computation means for computing image information about a group according to image information about patterns classified into a same group, wherein

said grouping means groups patterns according to the image information about the group.

25. The apparatus according to claim 24, wherein said group information computation means comprises color information computation means for computing color information about a group according to the color information about patterns classified into a same group.

26. The apparatus according to claim 25, wherein said color information about the group is an average value of colors of the patterns belonging to the same group.

27. The apparatus according to claim 25, wherein said group information computation means computes a grouping threshold according to the color information about the pattern classified into the same

group.

28. The apparatus according to claim 25, wherein
said grouping means groups patterns based on a
5   result of comparing the color information about the
group with color information about patterns to be
grouped.

29. The apparatus according to claim 25, wherein
10   said grouping means integrates groups based on
a result of comparing color information about the
group.

30. The apparatus according to claim 24, wherein:
15   said group information computation means
comprises:
group rectangle generation means for
generating an enclosing rectangle of an entire pattern
belonging to a same group; and
20   geometric information computation means for
computing a shape, size, or position of the enclosing
rectangle of the group, and
said grouping means integrates the groups based
on the shape, size, or position of the enclosing
25   rectangle of the group.

31.   The apparatus according to claim 24, wherein:

said   group   information   computation   means
comprises:

frequency distribution generation means for
5   generating a frequency distribution of thicknesses of
patterns in a same group; and

same thickness setting means for setting a
same pattern thickness range based on the frequency
distribution of the thicknesses, and

10   said   grouping   means   re-classifies   patterns
belonging to a same group based on the thickness of
a pattern set by said same thickness setting means.

32.   The apparatus according to claim 24, wherein
15   said   group   information   computation   means
comprises character recognition means for recognizing
a character of a pattern belonging to a same group;
and

said   grouping   means   re-classifies   patterns
20   belonging a same group based on a result of the
character recognition.

33.   The apparatus according to claim 25, wherein
said unicolor range setting means computes a
25   labeling threshold according to color information of

patterns classified into a same group.

34. The apparatus according to claim 25, wherein
said labeling means re-extracts patterns
belonging the group based on a result of comparing
color information of a group with color information
about picture elements in an area of enclosing
rectangles of the group.

35. An image processing apparatus comprising:
a color difference table for storing a maximum
value of a color difference between adjacent picture
elements based on a color luminance value and read
resolution as variables;
resolution obtaining means for obtaining read
resolution at which a color difference between
adjacent picture elements obtained from an input image
matches a color difference stored in the color
difference table individually for each of three
primary colors;
resolution computation means for computing the
read resolution of the input image based on the read
resolution of the three primary colors;
color difference obtaining means for obtaining
from the color difference table a color difference

corresponding to the read resolution of the input image;

threshold setting means for setting a labeling threshold based on the color difference obtained from said color difference table; and

labeling means for labeling the input image based on the threshold.

36. The apparatus according to claim 35, wherein said color difference table contains a maximum value of a color difference between adjacent picture elements for all luminance values of colors of an image.

37. An image processing apparatus comprising:

scanning means for scanning an image in a predetermined direction;

first counting means for counting a number of picture elements changing from a label other than a first label into the first label;

second counting means for counting a number of picture elements changing from the first label into a label other than the first label after two or more continuous picture elements labelled with the first label appear in the scanning direction; and

third counting means for counting a number of picture elements assigned the first label whose adjacent picture elements in the scanning direction are also assigned the first label, and at least one of whose adjacent picture elements in a direction vertical to the scanning direction is assigned a label other than the first label.

38. An image processing apparatus comprising:

unicolor area extraction means for extracting a unicolor area from an input image by comparing a predetermined first threshold with color information about the input image;

threshold computation means for computing a second threshold according to the color information about the unicolor area; and

unicolor area re-extraction means for re-extracting a unicolor area from the input image by comparing the second threshold with the color information about the input image.

39. A method of extracting a pattern for setting a threshold for use in extracting a unicolor area from a color image in consideration of color identification characteristics of a person.

40. The method according to claim 39, wherein

a threshold of a color difference in a unicolor range is enlarged for a color having low resolution to naked eyes, and a threshold of a color difference in a unicolor range is reduced for a color having high resolution to naked eyes.

41. A method of setting a labeling threshold, comprising the steps of:

extracting a part of a unicolor pattern from an input image;

setting a threshold for determining a unicolor range according to color information about the unicolor pattern extracted from the input image; and

extracting a remaining part of the unicolor pattern based on the threshold.

42. A method of setting a labeling threshold, comprising the steps of:

computing read resolution of a color image for each color element; and

setting a labeling threshold of the color image based on the read resolution for each color element.

43. A method of obtaining an outline length

comprising the steps of:

scanning an image in a predetermined direction; and

computing an outline length of a pattern in the image based on a frequency at which a label value changes in the scanning operation.

44. A computer-readable storage medium having a data structure in which a maximum value of a color difference between adjacent picture elements corresponding to a luminance value of a color when an image is read is entered for each read resolution.

45. A computer-readable storage medium storing a program used to perform a labeling process in different labeling methods based on a number of colors in a color image.

46. A computer-readable storage medium storing a program used to perform the steps of:

obtaining read information about an input image;

setting a labeling threshold of the input image according to the read information about the input image;

labeling the input image using the threshold;

grouping a label pattern obtained by the labeling;

obtaining image information about a group according to image information about a pattern in a same group; and

extracting a pattern according to image information about the group.